Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (original) An optoelectronic device comprising:

a multilayer semiconductor structure including an InP substrate and an active region, the active region comprising at least a hole quantum well layer of a semiconductor containing antimony and at least one electron quantum well layer adjacent to the hole quantum well layer which comprises a semiconductor containing nitrogen to provide a type II quantum well structure.

2. (original) The device of Claim 1 wherein the semiconductor containing antimony is GaAsSb or InGaAsSb and the semiconductor containing nitrogen is InAsN or InGaAsN.

3. (original) The device of Claim 2 wherein there is an electron quantum well layer on each side of the hole quantum well layer and there is a barrier layer adjacent to each electron quantum well layer on each side of the hole quantum well layer to provide a conduction band profile for the active region having a W-shaped configuration.

4. (original) The device of Claim 3 wherein the electron quantum well layers are in compressive strain and the hole quantum well layer is in compressive strain.

5. (original) The device of Claim 3 wherein the electron quantum well layers are in compressive strain and the hole quantum well layer is in tensile strain.

6. (original) The device of Claim 3 wherein the thickness of each electron quantum well layer and hole quantum well layer is between approximately 10 and 50 angstroms.

7. (original) The device of Claim 3 wherein the barrier layers comprise GaInP.

8. (original) The device of Claim 1 wherein the electron quantum well layers and hole quantum well layer form a first quantum well stage, and wherein the active region

comprises a plurality of quantum well stages adjacent to each other each having electron quantum well layers surrounding a hole quantum well layer.

9. (original) The device of Claim 8 including a barrier layer between each quantum well stage to provide a conduction band profile having a W-shaped configuration.

10. (original) The device of claim 9 wherein the barrier layer between each quantum well stage comprises GaInP.

11. (original) The device of Claim 1 including means for providing optical feedback to form an edge-emitting laser.

12. (original) The device of Claim 1 including means for providing optical feedback to form a vertical cavity surface emitting laser.

13. (original) The device of Claim 1 wherein the active region generates light having a wavelength greater than approximately 2 μm.

14. (original) The device of Claim 1 wherein the active region generates light having a wavelength of approximately 3 μm.

15. (original) The device of Claim 1 wherein the nitrogen content of the electron quantum well is 10% or less.

16. (original) An optoelectronic device comprising:

a multilayer semiconductor structure including an InP substrate and an active region, the active region comprising at least a hole quantum well layer of GaAsSb or InGaAsSb and an electron quantum well layer of InAsN or InGaAsN on each side of the hole quantum well layer to provide a type II quantum well structure.

17. (original) The device of Claim 16 wherein the electron quantum well layers are in compressive strain and the hole quantum well layer is in compressive strain.

18. (original) The device of Claim 16 wherein the thickness of each electron quantum well layer and hole quantum well layer is between approximately 10 and 50 angstroms.

19. (original) The device of Claim 16 including a barrier layer adjacent to each electron quantum well layer to form a conduction band profile having a W-shaped configuration.

20. (original) The device of Claim 19 wherein the barrier layer comprises GaInP.

21. (original) The device of Claim 16 wherein the electron quantum well layers and hole quantum well layer form a first quantum well stage, and wherein the active region comprises a plurality of quantum well stages adjacent to each other.

22. (original) The device of Claim 21 including a barrier layer of GaInP between each quantum well stage to form a conduction band profile having a W-shaped configuration.

23. (original) The device of Claim 16 wherein the percentage of Ga content of the electron quantum well layers is no more than 30%.

24. (original) The device of Claim 16 including means for providing optical feedback to form an edge-emitting laser.

25. (original) The device of Claim 16 including means for providing optical feedback to form a vertical cavity surface emitting laser.

26. (original) The device of Claim 16 wherein the nitrogen content of the electron quantum wells is 10% or less.

27. (original) An optoelectronic device comprising:

a multilayer semiconductor structure including an InP substrate and an active region, the active region comprising at least a hole quantum well layer of GaAsSb and a electron quantum well layer of InAsN on each side of the hole quantum well layer to provide a type II quantum well structure wherein the electron quantum well layers are in compressive strain and the hole quantum well layer is in compressive strain.

28. (original) The device of Claim 27 wherein the electron quantum well layers are lattice matched to InP.

29. (original) The device of Claim 27 wherein the thickness of each electron quantum well layer and hole quantum well layer is between approximately 10 and 50 angstroms.

30. (original) The device of Claim 27 including a barrier layer adjacent to each electron quantum well layer to form a conduction band profile having a W-shaped configuration.

31. (original) The device of Claim 30 wherein the barrier layers comprise GaInP.

32. (original) The device of Claim 27 wherein the electron quantum well layers and hole quantum well layer form a first quantum well stage, and wherein the active region comprises a plurality of quantum well stages adjacent to each other.

33. (original) The device of Claim 27 including a transitional layer of GaInP between each quantum well stage.

34. (original) The device of Claim 27 including means for providing optical feedback to form an edge-emitting laser.

35. (original) The device of Claim 27 including means for providing optical feedback to form a vertical cavity surface emitting laser.

36. (original) The device of Claim 27 wherein the active region generates light having a wavelength greater than approximately 2 μm.

37. (original) The device of Claim 27 wherein the active region generates light having a wavelength of approximately 3 μm.

38. (original) The device of Claim 27 wherein the nitrogen content of the electron quantum wells is 10% or less.

39. (original) A semiconductor laser comprising:

(a) a multilayer semiconductor structure including an InP substrate and an active region, the active region comprising at least a hole quantum well layer of a semiconductor containing antimony and at least one electron quantum well layer adjacent to the hole quantum well layer which comprises a semiconductor containing nitrogen to provide a type II quantum well structure; and

(b) means for providing optical feedback to provide lasing action in the active region.

40. (original) The laser of Claim 39 wherein there is an electron quantum well layer on each side of the hole quantum well layer and there is a barrier layer adjacent to each electron quantum well layer on each side of the hole quantum well layer to provide a conduction band profile for the active region having a W-shaped configuration.

41. (original) The laser of Claim 40 wherein the semiconductor containing antimony is GaAsSb or InGaAsSb and the semiconductor containing nitrogen is InAsN or InGaAsN.

42. (original) The laser of Claim 40 wherein the electron quantum well layers are in compressive strain and the hole quantum well layer is in compressive strain.

43. (original) The laser of Claim 40 wherein the electron quantum well layers are in compressive strain and the hole quantum well layer is in tensile strain.

44. (original) The laser of Claim 40 wherein the thickness of each electron quantum well layer and hole quantum well layer is between approximately 10 and 50 angstroms.

45. (original) The laser of Claim 40 wherein the barrier layer comprises GaInP.

46. (original) The laser of Claim 40 wherein the electron quantum well layers and hole quantum well layer form a first quantum well stage, and wherein the active region comprises a plurality of quantum well stages adjacent to each other each having electron quantum well layers surrounding a hole quantum well layer.

47. (original) The laser of Claim 46 including a barrier layer of GaInP between each quantum well stage.

48. (original) The laser of Claim 39 wherein the means for providing optical feedback forms an edge-emitting laser.

49. (original) The laser of Claim 39 wherein the means for providing optical feedback forms a vertical cavity surface emitting laser.

50. (original) The laser of Claim 39 wherein the active region generates light having a wavelength greater than approximately 2 μm.

51. (original) The laser of Claim 39 wherein the active region generates light having a wavelength of approximately 3 μm.

52. (original) The laser of Claim 39 wherein the nitrogen content of the electron quantum wells is 10% or less.

53. (previously presented) The device of Claim 1 wherein the semiconductor containing antimony is InGaAsSb.

54. (previously presented) The device of Claim 1 wherein the semiconductor containing nitrogen is InAsN.

55. (previously presented) The device of Claim 1 wherein there is an electron quantum well layer on each side of the hole quantum well layer and there is an optical confinement layer adjacent to each electron quantum well layer, the optical confinement layers comprising InP or InGaAsSb.

56. (previously presented) The device of Claim 1 wherein there is an electron quantum well layer on each side of the hole quantum well layer and there is a cladding layer adjacent to each electron quantum well layer, the cladding layers comprising InP or AlGaInAs.

57. (previously presented) The device of Claim 3 wherein there is an optical confinement layer adjacent to each barrier layer, the optical confinement layers comprising InP.

58. (previously presented) The device of Claim 16 wherein the hole quantum well layer is an InGaAsSb layer.

59. (previously presented) The device of Claim 16 wherein the electron quantum well layer is a InAsN layer.

60. (previously presented) The device of Claim 16 wherein there is an optical confinement layer adjacent to each electron quantum well layer, the optical confinement layer comprising InP or InGaAsSb.

61. (previously presented) The device of Claim 16 wherein there is a cladding layer adjacent to each electron quantum well layer, the cladding layer comprising InP or AlGaInAs.

62. (previously presented) The laser of Claim 39 wherein the semiconductor containing antimony is InGaAsSb.

63. (previously presented) The laser of Claim 39 wherein the semiconductor containing nitrogen is InAsN.

64. (previously presented) The laser of Claim 39 wherein there is an electron quantum well layer on either side of the hole quantum well layer and there is a cladding layer adjacent to each electron quantum well layer, the cladding layer comprising InP or AlGaInAs.

65. (previously presented) The laser of Claim 40 wherein there is an optical confinement layer adjacent to each barrier layer, the optical confinement layer comprising InP.

66. (new) The device of Claim 1 wherein the at least one electron quantum well layer comprises a semiconductor containing nitrogen and indium.

67. (new) The laser of Claim 39 wherein the at least one electron quantum well layer comprises a semiconductor containing nitrogen and indium.